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Non Invasive Imaging

IMPAIRED TWIST RATE IN PATIENTS WITH SEVERE AORTIC STENOSIS DESPITE NORMAL EJECTION FRACTION IDENTIFIED BY THREE-DIMENSIONAL SPECKLE TRACKING ECHOCARDIOGRAPHY

Poster Contributions
Hall C
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Background: At least some patients with severe aortic stenosis (AS) and preserved LVEF have a significant impairment of intrinsic myocardial systolic function. We explored whether LV rotational parameters could offer any insight into the LV performance in AS.

Methods: Thirty four consecutive patients (mean age= 76 ± 9, 50% men) with severe aortic stenosis (AVI<0.6 cm^2/m^2) and normal ejection fraction were studied. Exclusion criteria included other significant valvular disease, prior cardiac surgery, irregular rhythm and poor image window. We also studied 47 patients (mean age= 74±7, 43% men) as control group in which age, sex, HTN, DM, CAD were matched with AS group. We measured peak strain and time to peak strain (longitudinal, circumferential, radial and 3D), rotation (apical and basal), twist and torsion using full volume data. Systolic twist rate and diastolic untwist rate were also derived from the generated curves. The two groups were compared using one-way analysis of variance (ANOVA) in SPSS software version 20.

Results: There was no significant difference between peak and time to peak apical rotation, basal rotation, twist and torsion. Peak systolic twist rate was significantly smaller in AS group (6.2 ± 4.9 degrees/sec) compared to control group (10.1 ± 4.2 degrees/sec) with p=0.0001. Time to peak systolic twist rate was longer in AS patients (272 ± 84 ms) compared to control group (213 ± 100 ms) with p=0.007. Peak diastolic and time to peak untwist rate did not show significant differences between AS and control groups (-9.1 ± 6.0 vs. -10.0 ± 4.9 degrees/sec and 423 ±.65 vs. 435 ± 63.3 ms, respectively). Using a cut off value of 6.5 degrees/sec, systolic twist rate was low in 64 % of patients with severe AS, while only 10 % in control group had value below this cut off point.

Conclusion: Patients with severe AS exhibit myocardial dysfunction in rotational dynamics even when LV EF is normal.